

Comments of
The Environmental Law & Policy Center
on the Initial Assessments of the Impact
of Introducing Plug-in Electric Vehicles in Illinois

Submitted January 24, 2011

The Environmental Law & Policy Center commends the ICC for forming the Initiative on Plug-In Electric Vehicles (PEVs) and we appreciate the opportunity to provide comments on the Initial Assessment Reports. While ComEd, Ameren and MidAmerican are ultimately responsible for ensuring that the system can accommodate PEVs, the Commission's Initiative allows parties to play a valuable role in the process.

Compared to conventional vehicles with internal combustion engines, PEVs generate less pollution, even when the source of the electricity used to charge the vehicles is predominantly coal. The avoided emissions are even more significant where cleaner sources of energy, especially renewable energy, supply a portion of delivered electricity. Illinois' aggressive renewable energy standard and the concentration of nuclear and wind power plants in the northern part of the state create a favorable pollution reduction equation for PEVs. The ICC and other Illinois stakeholder should work together to further enhance environmental benefits by developing a regulatory and policy framework that rewards environmentally optimal charging behavior and business models.

The first generation of PEVs will appear in dealer showrooms and on Illinois roads over the next six to twelve months. The initial experience of the first generation of PEV owners – whether good or bad - will influence consumer perceptions of these new vehicles and thus, market penetration rates. ELPC and other members of the environmental community have an interest in seeing PEVs succeed in Illinois.

With this in mind, ELPC would like to offer comments on the following topics: (1) PEV Charging Rates; (2) Integration of Renewable Energy; and (3) Information and Education. The

questions we raise in Section (4) - Building Codes, Permit and Inspection Processes - are not addressed in the utility assessments, but should be on the agenda for the ICC's upcoming policy workshops.

I. PEV Charging Rates

Developing off-peak charging behavior works in the interests of grid reliability and economics. Illinois has substantial excess capacity available at night, and the marginal cost of both generation and distribution is lowest during off peak hours. Off-peak charging also means lower emissions, particularly in ComEd's service territory in Northern Illinois. ComEd did not submit "a description of the utility's system-wide fuel profile, including the proportion of electricity generated or purchased from coal, natural gas, and renewable sources, during peak and off peak periods and by season" as requested in the ICC's "Guidelines for Initial Assessments," but publicly available information indicates that "must-run" nuclear and wind power plants provide a large portion of off-peak supply in Northern Illinois. With low emission marginal power generation during off-peak hours, a strong PEV adoption rate and off-peak charging in ComEd's service territory can produce significant emission reductions.

Rates that reflect the lower marginal cost of power during off-peak hours can provide a strong incentive for optimizing consumer charging behavior, benefitting both customers and the utility. ComEd's analysis shows that charging PEVs off-peak under the existing real-time pricing rate (BESH) could save EV owners up to \$562 per year, depending on customer class, charging equipment and charging time. Commonwealth Edison Company Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System (ComEd

Assessment) at 48. Ameren's analysis shows that its existing super off-peak RTP rate would provide a modest incentive for non space-heating customer classes (up to about \$77 per year) compared with the flat (BGS) rate. Benefits for Ameren space-heating customers of switching to a real-time rate for off-peak PEV charging are very small or negative. Ameren Illinois Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System (Ameren Assessment) at 17. In Mid-American service territory, it would cost more to charge a vehicle under the existing residential time-of-use rate versus the standard seasonal (flat) rate, even during off-peak hours. MidAmerican Energy Company Initial Assessment of the System Impact of Plug-in Electric Vehicles (MidAmerican Assessment) at 23.

As PEV market penetration rates accelerate over the next decade, it will become more and more important that customers charge their vehicles during off-peak hours. Now is the time to establish the policy, regulatory, and market framework to shape consumer charging behavior in this way. Giving customers the option of charging vehicles under a separately metered Time-Of-Use (TOU) rate is emerging as a "best practice" among early adopter utilities (Detroit Edison and Consumers Energy in Michigan; San Diego Gas & Electric in California) because it: (1) provides the EV owner the ability have household demand and vehicle demand on two separate tariffs; (2) enables the utility to collect information about charging behavior and proactively avoid distribution system impacts; and (3) ultimately enables vehicle-to-grid (V2G) communication, whereby vehicles could provide grid regulation, energy storage or demand response services to the grid (and get paid for them).

ComEd notes that “PEV customers may be hesitant to elect such a rate (Rate BESH) for the non-PEV charging loads at their residence or commercial establishment if they cannot easily shift such loads to lower cost periods” (ComEd Assessment at 55). We agree with this observation. Offering customers the option of switching to a vehicle-only TOU rate may reduce real or perceived barriers to PEV consumer acceptance. While, enabling separate metering for TOU EV charging does come with additional complications and added expenses (e.g. meter separation costs and delays, back-office billing system adjustments), the long run benefits for customers and the utilities will more than justify these costs. The utilities should investigate and present to the ICC an analysis of the technical options that are available for accomplishing this objective and the associated costs and benefits. At minimum, the evaluation should include adding a separately metered circuit, sub-metering, and upgrading to AMI meters capable of recognizing separate loads. We recommend that the utilities review findings by San Diego Gas & Electric, DTE and Consumers Energy, and Indianapolis Power & Light Company. SDG&E, DTE and Consumers are installing separately metered circuits for customers opting to use EV TOU rates. IPL plans to use revenue grade IC chips and AMI meters to separate vehicle loads from household loads. There is no one-size-fits all solution, but certainly the early learning of these other utilities will provide valuable information.

To conclude, we recommend that the ICC consider the following recommendations when contemplating PEV rate and tariff design for at-home charging:

- (1) Each Illinois utility should make a standard TOU EV rate, with fixed off-peak and on-peak charges, available that gives EV owners a meaningful financial incentive to charge during off-peak hours.
- (2) Customers should have the option of placing vehicles on the TOU EV rate while keeping the rest of their household electric load on a fixed rate, if they so choose.
- (3) The utilities should evaluate options for separately metering EV load and should propose cost effective solutions for stakeholder/ICC consideration.

II. Renewable Energy Integration

There is a synergistic relationship between renewable energy development and electric vehicle development. Illinois should develop policies to encourage this connection while the EV market is still in its infancy. The Illinois Renewable Energy Standard (RES) will require tremendous growth in the amount of wind and solar energy sold into the state's power markets over the next fifteen years. Electric vehicles can facilitate RE market integration by providing well-matched demand for growing renewable energy supplies and serving as multi-purpose energy storage solutions.

Pairing solar energy systems with public charging stations (where daytime, peak period use is inevitable) can offset incremental peak demand. ComEd addresses solar charging stations in its Assessment on pp. 38-39, but says that they are not a cost-effective solution in the near-term without significant cost subsidies. We disagree. We think that Illinois' net metering standards and solar carve out open up the possibility for creative and economically viable business models that match vehicle electricity demand with solar electricity supply. Virtual net metering and

meter aggregation, allowed under Illinois' net metering statute 220 ILCS 5/16-107.5(k-1), would enable an electric vehicle charging business to install a solar farm at an off-site location - a vacant lot, for example. The business could apply the net metered credits generated at the solar farm (valued at peak prices) to offset the cost of power consumed at distributed vehicle charging stations, without the need for battery storage. The business could also sell the solar renewable energy credits or offer customers the option of paying a premium to charge vehicles with solar power (SREC included). This is just one example of how Illinois stakeholders should be thinking creatively about ways to shape the policy framework and encourage entrepreneurial innovation and competition in these areas.

Electric vehicles also have the potential to create stronger markets for Illinois wind energy as well. Night time vehicle charging can help strengthen wind energy economics and flatten load curves for the distribution utilities. Ultimately, smart grid-connected electric vehicle batteries can store lower-value night time wind power, and discharge it to the grid as higher-value peak power. The ICC, the utilities, and interested stakeholders should proactively seek out opportunities to design policy to leverage benefits of renewable energy and electric vehicle integration.

III. Information and Education

The ComEd Assessment includes a high-level summary of a two-phase plan to provide information to consumers about PEVs and charging infrastructure, p. 57. The Ameren Assessment contains a paragraph addressing necessary communication links between the utility, automobile dealers, the customer, and charging providers and installers, p. 2. The

MidAmerican Assessment acknowledges the need for customer education to avoid the potential for impacts on the electric system, but provides no detail, p. 1. We believe that the utilities can and should play an essential role in providing customers with basic information about PEVs, charging infrastructure, available rates, etc. Simple, clear outreach and educational materials should be targeted to different audiences, and the Commission should ensure stakeholder participation in crafting effective messages.

IV. Building Codes, Permit and Inspection Processes

The Guidelines for Initial Assessments included a request that the utilities provide “A description of any regulatory barriers that might create unnecessary delay for consumers for installation of at-home charging infrastructure” (#8). The utility assessments do not include any discussion of Building Codes, Electric Codes, or permitting and inspection processes. Though these subjects are outside the ICC’s traditional purview, they have the potential to create significant regulatory and bureaucratic hurdles to EV integration and should not be ignored. We recommend that the agenda of the spring workshops take up these subjects, and that stakeholders prepare to discuss the following questions:

- (1) Are technical requirements, building interface, and safety standards related to electric vehicle charging stations (at residential, commercial and public locations) sufficiently addressed in applicable building and electric codes in Illinois?
- (2) Do new codes and/standards need to be adopted at the state or local level? If so, what is the estimated timeline for adopting new codes and standards, how may it impact PEV adoption rates?

- (3) What are the specific permits, inspections and approvals that a customer would need to obtain in order to install a Level 2 home-charging station? How long would this process likely take from start to finish?
- (4) Will building and electrical inspectors need additional training to efficiently manage PEV-related requirements?
- (5) What role, if any, can the ICC take in facilitating these processes and encouraging a uniform approach across multiple local jurisdictions?

Conclusion

ELPC is enthusiastic about the introduction of PEVs and the associated opportunities for economic and environmental progress. We look forward to discussing these and other issues at the upcoming ICC workshops.

Respectfully submitted,

A handwritten signature in black ink that reads "Robert Kelter". The signature is written in a cursive, flowing style.

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